

**UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF ILLINOIS**

JEFFERY TOMASULO, on Behalf of Himself  
and All Others Similarly Situated,

Plaintiff,

v.

CBOE EXCHANGE, INC., CBOE GLOBAL  
MARKETS, INC., CBOE FUTURES  
EXCHANGE, LLC, and JOHN DOES,

Defendants.

Case No. 18-cv-2025

**FIRST AMENDED CLASS  
ACTION COMPLAINT**

**JURY TRIAL DEMANDED**

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**INTRODUCTION**

1. The Volatility Index, known under its ticker symbol “VIX,” is a benchmark index created by Defendant CBOE Exchange, Inc., a wholly owned subsidiary of Defendant CBOE Global Markets, Inc. (collectively, “CBOE”). Introduced in 1993, the VIX purports to measure the implied volatility of large cap U.S. stocks, over 30 days in the future.

2. Often dubbed the stock market’s “fear index” or “fear gauge,” the VIX is calculated based on real-time prices of certain put and call options on the Standard & Poor’s 500 Index (“SPX Options”) and is designed to reflect investors’ consensus view of near-term future expected stock market volatility. The VIX estimates expected volatility in the S&P 500 by averaging the weighted prices of SPX Options over a wide range of strike prices. Because prices of SPX Options are correlated with volatility — as investors’ expectation of volatility in the near future rises/falls, the price of SPX Options correspondingly rises/falls to reflect the respective

increased/decreased risk of those options due to wider/narrower expected fluctuations in the S&P 500 — expected volatility is calculated by the VIX in reference to SPX Options prices.

3. Although the VIX is a benchmark that cannot be traded, pursuant to authority granted to it under the Commodity Exchange Act, 7 U.S.C. §1 *et seq.*, the Chicago Board Options Exchange (“CBOE”) eventually created tradeable instruments linked to the VIX. On March 26, 2004, CBOE launched VIX Futures to be traded exclusively on the CBOE Futures Exchange (“CFE”), and on February 24, 2006 launched VIX Options to be traded exclusively on CBOE.

4. During the timeframe of this Complaint, trading activity in VIX Futures and Options ballooned. The average daily contract volume for VIX futures rose from **1,731** contracts per day in 2006 to **300,568** contracts per day in 2017 (through August 24, 2017), a 17,263% increase.<sup>1</sup> Meanwhile, the average daily volume of VIX Options in 2006 was **23,491**, and rose to **687,181** in 2017 (through July 2017), a 2,825% increase.<sup>2</sup>

5. Since their inception in 2009, there has also been a proliferation of trading in VIX-linked Exchange Traded Products (“VIX ETPs”) — an umbrella category that includes products such as exchange-traded funds (“ETFs”) and exchange-traded notes (“ETNs”) — which are instruments that track VIX futures but are traded on a public exchange. There are presently at least 18 active VIX ETPs (and at least an additional 19 that have closed), which have a combined current market cap of about \$3.4 billion.<sup>3</sup>

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<sup>1</sup> See Matt Moran, “Record Days for VIX Futures and Options Volume and Open Interest This Month,” CBOE (Aug. 25, 2017) <http://www.cboe.com/blogs/options-hub/2017/08/25/record-days-for-vix-futures-and-options-volume-and-open-interest-this-month> (last accessed Mar. 16, 2018).

<sup>2</sup> *Id.*

<sup>3</sup> Examples of active VIX ETPs include: iPath Inverse S&P 500 VIX Short-Term Futures ETN II (ticker symbol IVOP); ProShares Short VIX Short-Term Futures ETF (SVXY); VelocityShares Daily 2X

6. The exercise-settlement values of these VIX Futures and VIX Options (and the corresponding value of VIX ETPs that track them) are not calculated directly from the benchmark VIX, but rather are determined using a Special Opening Quotation (“SOQ”) — a special VIX value designed by CBOE and calculated on the settlement date of VIX derivatives prior to the opening of trading. On the VIX Futures’ and VIX Options’ settlement date, auction clearing prices of SPX Options are used to determine this SOQ (which can be found under the ticker symbol “VRO”). Manipulation of this SOQ value would correspond to manipulation in the values of VIX Futures and VIX Options, as well as the VIX ETPs that track them.

7. This CBOE-designed SOQ is highly susceptible to manipulation for a variety of reasons, including, but not limited to, the fact that it occurs during a fixed, short window during non-trading hours. Over the past year, evidence has become publicly available that strongly suggests, if not establishes, manipulation of the VIX SOQ to influence the pricing of VIX Options, VIX Futures, and VIX ETPs (collectively, “VIX Instruments”). Indeed, former SEC Chairman Harvey Pitt has been quoted as saying that “it’s quite clear that [VIX] options can be manipulated. And when there were complaints about possible manipulation, CBOE, as the marketplace, should have sprung into action.”<sup>4</sup>

8. The VIX manipulation described herein is undertaken by a select group of financial institutions and trading firms (the “John Doe Defendants”) with sophisticated, expensive technology and/or the exclusively CBOE-authorized ability to make markets on SPX Options. These CBOE-granted advantages allow the John Doe Defendants to deploy capital to

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VIX Short-Term ETN (TVIX); ProShares Ultra VIX Short-Term Futures ETF (UVXY); VelocityShares VIX Short-Term ETN (VIIX); ProShares VIX Short-Term Futures ETF (VIXY); iPath S&P 500 VIX Short-Term Futures ETN (VXX); and iPath S&P 500 Dynamic VIX ETN (XVZ).

<sup>4</sup> See Mark DeCambre, “Ex-SEC chairman says ‘it’s quite clear’ Wall Street’s ‘fear gauge’ can be manipulated,” MARKETWATCH (Feb. 16, 2018), <https://www.marketwatch.com/story/ex-sec-chairman-says-its-quite-clear-wall-streets-fear-gauge-can-be-manipulated-2018-02-16> (last accessed Mar. 16, 2018).

post offers and bids or enter into contracts on SPX Options collusively during the limited time window in which those options influence the SOQ settlement price of VIX Futures and VIX Options, and thereby manipulate the value of their more liquid holdings in VIX Futures and VIX Options in their favor. Essentially, the John Doe Defendants use their CBOE-granted privileged access to the S&P 500 options market and their high-frequency trading algorithms to manipulate the VIX Index calculation in concert, and, by doing so, generate massive profits for their much larger positions in VIX Futures and VIX Options.

9. In addition, and also on information and belief, the John Doe Defendants also own a variety of VIX ETPs, the underlying performance of which is directly tied to the VIX. The same manipulative behavior that the John Doe Defendants engage in to manipulate the VIX and profit from their positions in VIX Futures and VIX Options in turn also directly benefits the positions of the John Doe Defendants in their respective VIX ETP holdings.

10. This manipulation of the VIX has caused billions in losses for institutional and retail investors in VIX Instruments throughout the proposed Class Period.

11. Because CBOE has chosen to keep the trading of SPX Options anonymous, Plaintiff is not yet able to identify the precise number and identity of the manipulators acting in concert with one another and with the knowledge of CBOE. However, CBOE possesses that information — indeed, it is required to maintain it under the Commodity Exchange Act, 7 U.S.C. §7(d) — and Plaintiff will be able to use that information to identify the John Doe Defendants through discovery. Upon information and belief, many or all of the John Doe Defendants are SPX Options market makers — an exclusive group whose membership is controlled by CBOE.

12. The John Doe Defendants would not have been able to manipulate the VIX Index to the extent they did without the cooperation of CBOE. Upon information and belief, CBOE

intentionally designed its products, operated its platforms, and formulated the method for calculating VIX and the SOQ in a manner that could be collusively manipulated in a single, narrow period of time with even low-premium trades by the John Doe Defendants, and especially by the John Doe Defendants who were given status as SPX Options market makers by CBOE. This conduct reflects CBOE's intent to join the conspiracy. Indeed, some of CBOE's initiatives pertaining to the VIX and SOQ were implemented only after it sought and obtained close consultation and significant contributions on these initiatives from certain financial institutions that trade heavily in VIX Instruments, such as Goldman Sachs. Furthermore, CBOE permitting VIX Instruments to be traded despite the fact that they are readily susceptible to such manipulation was and continues to be a violation of the Commodity Exchange Act, 7 U.S.C. §7(d).

13. The John Doe Defendants also benefited from CBOE's inaction in response to its knowledge that the VIX Index was being manipulated. Under 7 U.S.C. §7(d), CBOE was required to monitor and enforce compliance with its rules prohibiting abusive trade practices, including having adequate resources and capacity to "detect, investigate, and apply appropriate sanctions to any person that violates any rule of the contract market" of CBOE in regards to manipulative and abusive trading practices, and to "establish and enforce rules . . . to protect markets and market participants from abusive practices committed by any party . . . [and] to promote fair and equitable trading on the contract market." Despite knowing or having considerable reason to suspect that manipulation of the VIX Index was occurring through the VIX Instruments traded on CBOE's markets (as detailed below in this Complaint), CBOE took no effective action to stop the manipulation and collusion. Rather, it adopted a *laissez faire*

approach, thereby enabling the manipulation to continue, while protecting the growth of VIX Instruments trading on its markets.

14. By no coincidence, CBOE has profited handsomely from the manipulation of the VIX. With the proliferation of VIX Instruments, CBOE has seen net revenues increase, net transaction fees shoot up, and contract fees close to double. As a result of this VIX Instrument-fueled growth, the value of Class A common stock in CBOE's holding company, CBOE Global Markets, Inc., has increased by over 300% since its inception in June 2010.<sup>5</sup> This has directly benefited CBOE officers and board members, who were compensated heavily with CBOE stock between 2010 and the present.

15. Defendants' conspiratorial conduct violates Section 1 of the Sherman Act and has caused injury to investors in VIX Instruments. Defendants' conduct also caused actual damages to Plaintiff and members of the proposed Class in violation of the Commodity Exchange Act, 7 U.S.C. §1 *et seq.* Plaintiff, on behalf of himself and members of the proposed Class, seeks damages caused by Defendants' manipulation and Defendants' violations of the Commodity Exchange Act, including treble damages and injunctive relief.

### **PARTIES**

16. Plaintiff Jeffery Tomasulo transacted in VIX Futures and the iPath S&P 500 VIX ST Futures ETN (VXX) during the Class Period and has been injured in his business or property by reason of Defendants' violations of law as alleged herein.

17. Defendant CBOE Exchange, Inc. is a Delaware corporation with its principal place of business at 400 South LaSalle Street, Chicago, IL 60605. CBOE Exchange is a wholly owned subsidiary of CBOE Global Markets, Inc. which is also a Delaware corporation with its

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<sup>5</sup> See CBOE: Summary for CBOE Global Markets, Inc., <http://finance.yahoo.com/quote/CBOE/> (last accessed Mar. 16, 2018).

principal place of business at 400 South LaSalle Street, Chicago, IL 60605. CBOE Futures Exchange, LLC is a Delaware limited liability company with its principal place of business at 400 South LaSalle Street, Chicago, IL 60605.

18. John Doe Defendants are those financial institutions that manipulated VIX Instruments through the collusive trading in and posting of quotes for SPX Options during the times those SPX Options trades and quotes were used in the settlement calculation of VIX Futures and VIX Options, and, relatedly, influenced the price of VIX ETPs. Plaintiff will be able to identify the John Doe Defendants through discovery of trading records in the possession of CBOE that CBOE is required to maintain under the Commodity Exchange Act, including but not limited to, Order Entry Operator identifications, Tag 50 IDs, User Assigned IDs, and Clearing Information.

#### **JURISDICTION AND VENUE**

19. This is a claim brought pursuant to the Sherman & Clayton Acts and pursuant to the Commodity Exchange Act. The Court has jurisdiction pursuant to 28 U.S.C. §1331.

20. This Court has personal jurisdiction over each Defendant. All Defendants are reasonably believed to have: (1) transacted business in the United States, including in this District; (2) substantial contacts with the United States, including in this District; and (3) committed substantial acts in furtherance of the claims herein in the United States, including in this District, including the manipulation of the prices of VIX Instruments traded in this District. In addition, Defendants' conspiracy was directed at, and had the intended effect of, causing injury to persons residing in, located in, or doing business in the United States, including in this District, and Plaintiff's claims arise out of the Defendants' conduct.

21. Venue is proper in this District under 28 U.S.C. §1391(b), (c), and (d). Defendants resided, transacted business, were found, or had agents in this District; a substantial part of the events giving rise to Plaintiff's claims arose in this District; and a substantial portion of the affected interstate trade and commerce described herein has been carried out in this District.

22. The activities of Defendants were within the flow of, were intended to, and did have a substantial effect on the interstate commerce of the United States.

### **FACTUAL ALLEGATIONS**

#### **I. BACKGROUND AND STRUCTURE OF VIX AND VIX INSTRUMENTS**

##### **A. The VIX Benchmark**

23. VIX is a benchmark index that measures the 30-day expected volatility of the S&P 500 Index for large cap U.S. stocks. First introduced in 1993, VIX is calculated and published by CBOE every fifteen seconds during CBOE's regular trading hours (8:30 a.m. to 3:15 p.m. Central time) and extended trading hours (2:00 a.m. to 8:15 a.m. Central time), based on the prices of certain "put" and "call" SPX Options traded during those time periods.<sup>6</sup>

24. VIX relies upon the price of SPX Options as a stand-in to measure expected near-term volatility because one component in the price of SPX Options is an estimate of how volatile the S&P 500 will be between now and the option's expiration date, allowing the volatility that the market expects in the S&P 500 over the next 30 days to be estimated from SPX Option prices settling around 30 days from the present. If expected near-term future volatility (and thus swings

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<sup>6</sup> A "put" or "put option" is a financial contract which gives the owner the right, but not the obligation, to sell an agreed quantity of a particular commodity or financial instrument (the underlying), at a specified price (the strike), by a predetermined date (the expiration date). A "call" or "call option" is a financial contract which gives the owner the right, but not the obligation, to buy an agreed quantity of a particular commodity or financial instrument (the underlying) at a certain time (the expiration date) for a certain price (the strike price).



in the market price of the S&P 500) is high, SPX Options (which serve as a means to hedge against large swings in the price of the S&P 500) are more valuable and thus more expensive. If expected near-term future volatility is low, the benefits of holding SPX Options to hedge against swings in the S&P 500 is lower, and therefore the prices of SPX Options are also cheaper.

25. To come up with a 30-day measure of expected volatility in the S&P 500, the data used for VIX calculation are trades of near- and next-term put and call SPX Options with more than 23 days and less than 37 days to expiration; if there is no traded price for a given SPX Option, the average of the bid and ask price of near- and next-term put and call options with more than 23 days and less than 37 days to expiration is used instead. These include SPX options with “standard” third Friday expiration dates and “weekly” SPX options that expire every Friday, except the third Friday of each month.

26. Once each week, the SPX options used to calculate VIX “roll” to new contract maturities in order to maintain a 30-day expectation of volatility measured by the index. For example, on the second Tuesday in October, the VIX index would be calculated using SPX options expiring 24 days later (*i.e.*, “near-term”) and 31 days later (*i.e.*, “next-term”). On the following day, the SPX options that expire in 30 calendar days would become the “near-term” options and SPX options that expire in 37 calendar days would become the “next-term” options, thereby maintaining the “more than 23 days and less than 37 days to expiration” window.

27. Below is CBOE’s standard formula used to calculate both the VIX and the SOQ. The values used in the calculation include: (1) forward SPX level “F”; (2) time to expiration “T”; (3) risk-free interest rate “R”; (4) “ $K_i$ ” representing the strike price for any given out-of-the-money SPX option “ $i$ ”; (5) the price of that selected option “ $Q(K_i)$ ”; and (6) the average distance between strike prices immediately above and below the forward index level, or “ $\Delta K_i$ .”

$$VIX = 100 * \sqrt{\frac{2}{T} \sum_i \frac{\Delta K_i}{K_i^2} e^{RT} Q(K_i) - \frac{1}{T} \left[ \frac{F}{K_0} - 1 \right]^2}$$

28. The SPX forward level calculation (*i.e.*, “F” value in the above formula), is based on the strike price at which the absolute difference between the call and put prices is smallest. In the table below listing hypothetical SPX calls and puts, the difference between the call and put prices is smallest at the 1965 strike. As such, the 1965 strike will be utilized to determine the forward SPX level.

Strike Price	Call	Put	Difference
...	...	...	...
1940	38.45	15.25	23.20
1945	34.70	16.55	18.15
1950	31.10	18.25	12.85
1955	27.60	19.75	7.85
1960	24.25	21.30	2.95
1965	21.05	23.15	2.10
1970	18.10	25.05	6.95
1975	15.25	27.30	12.05
1980	12.75	29.75	17.00
...	...	...	...

29. Only “out-of-the-money” options that have non-zero bids are included.<sup>7</sup> A call option is out of the money when the strike price of the option is higher than the market price of the underlying asset. A put option is out of the money when the strike price of the option is lower than the market price of the underlying asset.

30. The selection of strikes goes from the at-the-money strike up (for calls) and down (for puts), until two consecutive strikes with zero-bid price are found in each direction. No other options beyond such two consecutive zero-bid strikes are included. Examples below illustrate the selection process:

Put Strike	Bid	Ask	Include?
1345	0	0.15	<i>Not considered following two zero bids</i>
1350	0.05	0.15	
1355	0.05	0.35	
1360	0	0.35	No
1365	0	0.35	No
1370	0.05	0.35	Yes
1375	0.1	0.15	Yes
1380	0.1	0.2	Yes
.	.	.	.

Call Strike	Bid	Ask	Include?
.	.	.	.
2095	0.05	0.35	Yes
2100	0.05	0.15	Yes
2120	0	0.15	No
2125	0.05	0.15	Yes
2150	0	0.1	No
2175	0	0.05	No
2200	0	0.05	<i>Not considered following two zero bids</i>
2225	0.05	0.1	
2250	0	0.05	
.	.	.	.

<sup>7</sup> If an option were to be exercised if it were to expire today (and thus would result in a payout to the option holder), it is said to be “in the money.” If the current price and strike price are equal, it is said to be “at the money.”

**B. VIX Futures and VIX Options**

31. Because investors cannot trade the VIX directly, CBOE needed to create VIX-related products if it wanted to monetize the VIX and utilize it as a directly traded benchmark, *i.e.*, to generate profits. Futures and options are types of contracts that CBOE is authorized to create and offer as a board of trade designated as a contract market under the Commodity Exchange Act. However, CBOE can only list contracts “that are not readily susceptible to manipulation.” 7 U.S.C. §7(d)(3).

32. VIX Futures are a type of futures known as financial futures. “Financial futures usually take the form of a contract that depends on the value of an index at some future date.” *Board of Trade of City of Chicago v. S.E.C.*, 187 F.3d 713, 715 (7th Cir. 1999). The buyer (known as the “long” position) of a financial futures contract that is based on the value of a specified index might promise to buy 100 times the value of that index on a defined future date (the “settlement date”), and the seller (known as the “short” position) will receive that price on that date.

33. The parties may close their position in the financial futures contract at any time prior to the settlement date by buying or selling an offsetting obligation. Alternatively, they can hold the financial futures contract through the settlement date, at which point the long position can either receive cash from, or pay cash to, the short position, depending on whether the price it agreed to pay for the financial futures contract is above or below the price of the specified index at the time of settlement (the “spot price”).

34. The price of a VIX Future will increase if market expectations for volatility increase above current expectations (as reflected by the current VIX price) and will decrease if

market expectations for volatility decrease below current levels (as reflected by the current VIX price). As explained by CBOE:

Assume, for example that today is August 10 and the VIX index is 20. If market expectations are for 30-day implied volatility to be higher than 20 in October and lower than 20 in December, then October VIX futures will be trading at a level above 20 and December VIX futures will be trading below 20.

35. Investors can also take positions that have exposure to underlying VIX Futures by trading VIX Options. VIX Options can be either put or call options.

36. A VIX call option gives the holder the right, but not the obligation, to buy a particular VIX Futures Contract at a specified price, known as the “strike price,” at some predetermined date in the future. The option to purchase the contract is said to “expire” when the future date in question comes to pass. An investor typically buys a VIX call option when he expects the price of the corresponding VIX Future to rise above the call’s strike price.

37. Conversely, a VIX put option gives the holder the right, but not the obligation, to sell a VIX Futures Contract at the strike price at the date of expiration. The buyer of a VIX put option will be “in-the-money” if the price of the corresponding VIX Futures price drops below the put’s strike price.

38. CBOE launched VIX Futures on March 26, 2004 for exclusive trading on the CFE,<sup>8</sup> and CBOE launched VIX Options on February 24, 2006 for exclusive trading on the Chicago Board Options Exchange.<sup>9</sup>

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<sup>8</sup> See [https://www.cboe.com/aboutcboe/cboe-cbsx-amp-cfe-press-releases?DIR=ACNews&FILE=cboe\\_cfe\\_20040326.doc&CreateDate=26.03.2004&Title=CBOE%20Futures%20Exchange%20\(CFE\)%20Successfully%20Launches%20Today%20-%20Volume%20In%20VIX%20Futures%20Is%20Robust](https://www.cboe.com/aboutcboe/cboe-cbsx-amp-cfe-press-releases?DIR=ACNews&FILE=cboe_cfe_20040326.doc&CreateDate=26.03.2004&Title=CBOE%20Futures%20Exchange%20(CFE)%20Successfully%20Launches%20Today%20-%20Volume%20In%20VIX%20Futures%20Is%20Robust) (last accessed Mar. 16, 2018).

<sup>9</sup> See [https://www.cboe.com/aboutcboe/cboe-cbsx-amp-cfe-press-releases?DIR=ACNews&FILE=cboe\\_cfe\\_20060221.doc&CreateDate=21.02.2006&Title=CBOE%20TO%20BEGIN%20TRADING%20OPTIONS%20ON%20THE%20CBOE%20VOLATILITY%20INDEX%20\(VIX\)%20ON%20FRIDAY,%20FEBRUARY%2024,%202006](https://www.cboe.com/aboutcboe/cboe-cbsx-amp-cfe-press-releases?DIR=ACNews&FILE=cboe_cfe_20060221.doc&CreateDate=21.02.2006&Title=CBOE%20TO%20BEGIN%20TRADING%20OPTIONS%20ON%20THE%20CBOE%20VOLATILITY%20INDEX%20(VIX)%20ON%20FRIDAY,%20FEBRUARY%2024,%202006) (last accessed Mar. 16, 2018).

### **C. The Settlement of VIX Futures and Options**

39. As discussed above, the final settlement value for VIX Futures and Options is not determined the same way as the standard VIX benchmark calculation. Rather, final settlements are derived based on a modified calculation known as the Special Opening Quotation or SOQ. The SOQ is calculated using the auction clearing prices of SPX options.

40. The settlement of standard (*i.e.*, 30-day) VIX Futures and Options contracts generally occurs on the third or fourth Wednesday of each month that is 30 days prior to the third Friday of the calendar month immediately following the month in which the contract expires. For example, July 2010 VIX Futures contracts expired on Wednesday, July 21, 2010, which was 30 days prior to Friday August 20, 2010.

41. CBOE's proprietary auction mechanism, known as the Hybrid Opening System or HOSS, determines opening prices for the constituent SPX option series used in calculating the SOQ of VIX Futures and Options. To determine the opening price, HOSS matches buy and sell orders residing on the electronic order book immediately prior to market open. The algorithm matches trades on a *pro rata* basis. The opening price for any constituent option series in which there is no trade is the average of that option's bid price and ask price as determined at the opening of trading.

42. Starting at 7:30 a.m. CST and until 8:20 a.m. CST (8:15 a.m. prior to February 15, 2017, *i.e.*, prior to the opening of normal trading hours), SPX Options orders are included in the settlement calculation for VIX Options and Futures on the day of settlement of the underlying contract.<sup>10</sup> Between 8:20 a.m. CST and 8:30 a.m. CST, strategy orders — defined as SPX option

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<sup>10</sup> John M. Griffin and Amin Shams, "Manipulation in the VIX?" (May 23, 2017), <https://ssrn.com/abstract=2972979> (last accessed Mar. 16, 2018) (hereinafter "Griffin Paper"); "Cboe Volatility Index® (VIX® Index®) FAQs," CBOE, <http://www.cboe.com/products/vix->

orders that are related to positions in VIX derivatives and span over a wide range of strikes with 30 days to maturity — can no longer be submitted or cancelled.<sup>11</sup> Only orders unrelated to outstanding VIX positions can be submitted after 8:20 a.m. CST. At 8:30 a.m., the prices of SPX Options from this 7:30 a.m. until 8:20 a.m. window that meet the criteria for involvement in the VIX calculation are used to determine the SOQ value.

43. The settlement price determined by the SOQ uses a formula similar to the spot VIX benchmark. The forward SPX price is decided by the strike which has the smallest absolute difference in price between the calls and puts. It then selects strikes using the forward SPX level to determine which puts and calls are included in the calculation the same as with the spot VIX benchmark until it reaches two consecutive zero bid strikes (*see* paragraph 30, *supra*). Using just those strikes and forward level, the settlement price is determined through application of the same formula used to calculate the spot VIX index.

#### **D. VIX Exchange-Traded Products**

44. Exchange-traded products (ETPs) are a type of security that is derivatively priced and trades intra-day on a national securities exchange. ETPs are “hybrid instruments” under the Commodity Exchange Act (7 U.S.C. §1(29)), priced so their value is derived from other investment instruments, such as a commodity, a currency, a share price or an interest rate. Generally, ETPs are benchmarked to stocks, commodities, or indices. They can also be actively managed funds. ETPs include exchange-traded funds (ETFs), exchange-traded vehicles (ETVs), exchange-traded notes (ETNs) and certificates. ETPs are traded on exchanges (like the New

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index-volatility/vix-options-and-futures/vix-index/vix-faqs (last accessed Mar. 16, 2018); “CBOE Regulatory Circular RG17-006 CFE Regulatory Circular RG17-001,” CBOE (Jan. 19, 2017), <https://cfe.cboe.com/publish/CFEregcirc/CFEREG17-001.pdf> (last accessed Mar. 16, 2018).

<sup>11</sup> Griffin Paper at 8.

York Stock Exchange), and thus can be bought and sold by individual investors as easily as any share of common stock.

45. VIX trading exploded on the heels of the Financial Crisis of 2007-2008. For example, between January 1, 2004 and December 31, 2006, the VIX never reached above 24 at any single point. However, while U.S. financial markets were generally melting down during the Financial Crisis, the VIX was growing — between January 1, 2007 and December 31, 2009, the VIX closed above 24 on 376 out of 756 trading days (49.7% of trading days), closing at an all-time high of 80.86 on November 20, 2008.<sup>12</sup>

46. Recognizing this as an opportunity, Barclays plc devised a product that was ostensibly much more palatable for a wider investing audience. The bank created the first VIX ETP: an instrument that tracks VIX futures, but which trades on an exchange like any other corporate stock. The Barclays iPath S&P 500 VIX Short-Term Futures ETN launched in 2009.<sup>13</sup> That instrument, along with other VIX ETPs that quickly followed, attracted a massive influx of investors thanks to being readily available for trading on public exchanges.

#### **E. CBOE's Role in the VIX**

47. CBOE was central to the creation of the VIX and the explosion in trading in VIX Futures, VIX Options, and VIX ETPs. CBOE was solely responsible for determining and selecting the formula used to calculate VIX, as well as the modified SOQ calculation process used to determine the settlement price of VIX Futures and Options. The SPX Options that influence VIX, VIX Futures, and VIX Options are all traded exclusively on CBOE Options

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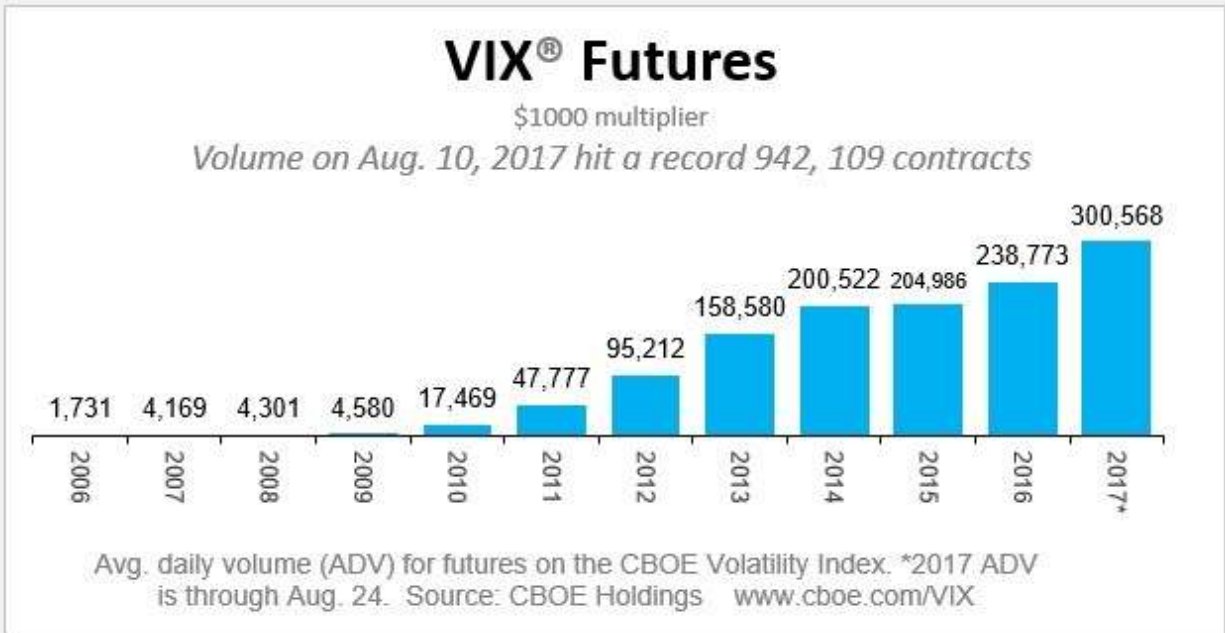
<sup>12</sup> See “VIX data for 2004 to present (Updated Daily),” VIX Options and Futures Historical Data, CBOE, <http://www.cboe.com/products/vix-index-volatility/vix-options-and-futures/vix-index/vix-historical-data> (last accessed Mar. 16, 2018).

<sup>13</sup> See Product Summary, iPath® S&P 500® VIX Short-Term Futures™ ETN, <http://www.ipathetn.com/US/16/en/details.app?instrumentId=259118> (last accessed Mar. 16, 2018).



Exchange and/or CFE, and were all created by CBOE pursuant to the authority granted to it under the Commodity Exchange Act. VIX ETPs were likewise dependent on CBOE's selection process for determining and calculating the VIX and the modified SOQ formula for settlement prices of VIX Futures and Options.

48. As discussed above, during the timeframe of the VIX manipulation (January 1, 2009 to the present), trading in VIX Instruments skyrocketed. The following charts demonstrate the rapid growth in average daily trading volume in both VIX Options and VIX Futures from 2006 through the first half of 2017:



49. CBOE charges a fee for every transaction involving VIX Futures and Options contracts.<sup>14</sup> CBOE's revenue from overall transaction fees increased almost fourfold during the

<sup>14</sup> See CBOE Exchange, Inc. Fees Schedule – March 1, 2018, <http://www.cboe.com/publish/feeschedule/cboefeeschedule.pdf> (last accessed Mar. 16, 2018).

Proposed Class Period (dating from January 1, 2009 to the present), climbing to approximately \$1.56 billion in 2017.<sup>15</sup>

50. CBOE has profited handsomely from the creation of the VIX and its pivotal role in the VIX market, and it has a vested interest in ensuring the VIX flourishes. A review of CBOE's 2017 earnings release yielded the following observations about VIX products:

- Excluding legacy Bats' net revenue contribution, CBOE's organic net revenue was \$154.1 million, up \$11.1 million or 8%, compared to the fourth quarter 2016. The increase is primarily attributable to stronger trading volume and higher revenue contributed from VIX futures and proprietary index options.
- Net transaction fees generated by CBOE's proprietary index options accounted for 83% of options net transaction fees and were up \$10.3 million or 13% versus the fourth quarter of 2016 combined. The increase resulted from an 18% increase in index options ADV, driven by increases of 24% and 18% in VIX and SPX options, respectively, offset somewhat by a 4% decrease in the RPC for index options to \$0.682 from \$0.712 in last year's fourth quarter.
- Futures net revenue of \$35.6 million increased \$8.5 million or 31%, primarily due to higher transaction fees resulting from a 21% increase in VIX futures ADV and a 7% increase in RPC. The RPC rose to \$1.799 in the fourth quarter of 2017 compared with \$1.683 in the fourth quarter of 2016, primarily due to pricing changes implemented in January 2017.
- In 2017, trading volume in VIX futures set a new record for the 13th consecutive year with ADV of 294,000 contracts, up 23 percent compared with 2016. According to CBOE's 2016 Annual Report, CBOE's "transaction fees generated by our futures and index options increased from approximately 57.5% of total transaction fees in 2011 to approximately 88.2% in 2016. This increase is primarily due to increased trading volume and fees generated by our proprietary VIX options and futures SPX options" with "[t]he bulk of this revenue . . . attributable to [CBOE's] S&P 500 Index options and VIX Index options and futures."<sup>16</sup>

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<sup>15</sup> See CBOE Global Markets, Inc. 2017 Annual Report, <http://ir.cboe.com/~media/Files/C/CBOE-IR-V2/financial-information/cboe-10-k-2017.pdf> at 55 (last accessed Mar. 16, 2018).

<sup>16</sup> See CBOE Holdings, Inc. 2016 Annual Report, [https://www.cboe.com/framed/pdf/framed?content=/aboutcboe/annualreportarchive/annual-report-2016.pdf&section=SEC\\_ABOUT\\_CBOE&title=CBOE+Annual+Report+2016](https://www.cboe.com/framed/pdf/framed?content=/aboutcboe/annualreportarchive/annual-report-2016.pdf&section=SEC_ABOUT_CBOE&title=CBOE+Annual+Report+2016) at 26 (last accessed Mar. 16, 2018). This final point is telling, as SPX

51. This growth in CBOE earnings as a result of transaction fees related to trading in VIX Futures and VIX Options has also contributed to considerable growth in the value of shares in CBOE Global Markets, Inc., the holding company of CBOE. Since June 14, 2010 (when CBOE's former non-stock corporation owned by its CBOE seat-holding members was converted via a restructuring transaction into CBOE Global Markets Class A common stock owned by its stockholders), the value of a share of CBOE Global Markets common stock has risen from an IPO price of \$29 to a March 13, 2018 closing price of \$119.93 — a 300%+ increase in value. An April 6, 2017 CBOE Notice of Proxy Meeting Statement reveals that all serving directors, nominees, and executive officers of CBOE collectively held 2,099,085 shares of CBOE common stock — all of which had been awarded to those directors, nominees, and executive officers since 2010.<sup>17</sup>

52. Under the Commodity Exchange Act, 7 U.S.C. §7(d), CBOE is also required to monitor and enforce compliance with the rules of the contract market, including rules prohibiting abusive trade practices and market manipulation. The CBOE Office of Enforcement is responsible for resolving disciplinary matters on behalf of the exchanges operated by CBOE.<sup>18</sup> The Department of Market Regulation (“DMR”) is ultimately responsible for monitoring CBOE

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Options are the very means by which Plaintiff and the Class members allege the John Doe Defendants manipulated the VIX SOQ settlement, while VIX Futures and Options are the very products that stood to benefit from such manipulation.

<sup>17</sup> See CBOE Holdings, Inc. Notice of Annual Meeting of Stockholders, <http://ir.cboe.com/~media/Files/C/CBOE-IR-V2/documents/annual-proxy/2017-cboe-holdings-proxy-statement.pdf> (last accessed Mar. 15, 2018).

<sup>18</sup> See Office of Enforcement, <http://www.cboe.com/aboutcboe/legal-regulatory/departamental-overviews/office-of-enforcement> (available at Mar. 16, 2018).

compliance with trading rules and procedures, including the surveillance and investigative work required therein.<sup>19</sup>

53. However, most surveillance for the CFE is conducted by FINRA and the National Futures Association (“NFA”) pursuant to a Regulatory Services Agreement (“RSA”). As the largest independent regulator for securities firms conducting business in the United States, FINRA has at its disposal, a vast array of surveillance systems that are deployed throughout a broad swath of financial markets. By virtue of these systems, FINRA is uniquely situated to effectively detect manipulation that occurs across multiple markets.

54. Indeed, FINRA and CBOE acknowledged as much, in connection with the above-referenced RSA entered into between these entities, effective January 2015.<sup>20</sup> FINRA has further stated in its Annual Reports: “Our cross-market surveillance patterns allow us to track orders from their inception, as they move through markets and are either cancelled, replaced or executed. This is particularly important since some market participants are increasingly dispersing their activity across trading venues in an effort to mask improper trading schemes. More than 50 percent of our trading alerts involve conduct occurring on more than one market, and more than 45 percent of our cross-market alerts involve two or more market participants.”<sup>21</sup>

55. Upon information and belief, as VIX Futures trading grew substantially during the Class Period, CBOE prevented adequate surveillance of the market by FINRA and the NFA, thereby allowing the manipulation to continue unabated and undetected. CBOE deliberately

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<sup>19</sup> See “Department of Market Regulation,” CBOE <http://www.cboe.com/aboutcboe/legal-regulatory/departamental-overviews/departament-of-market-regulation> (last accessed Mar. 16, 2018).

<sup>20</sup> See FINRA Signs Regulatory Services Agreement with CBOE and C2, at <http://www.finra.org/newsroom/2014/finra-signs-regulatory-services-agreement-cboe-and-c2> (last accessed March 19, 2018).

<sup>21</sup> See also 2014 YIR AFR.

sought to maintain the surveillance of Futures — and, specifically, VIX Futures — separate and apart from the larger surveillance objectives handled by FINRA and the NFA. Under the RSA with FINRA and the NFA, the enforcement tasks not covered by the NFA in the Futures market, including audit trail examinations, quoting reviews, intra-day monitoring, and importantly, VIX expiration review, are handled by CBOE’s Department of CFE Regulation (“CFER”).<sup>22</sup> By maintaining the exclusive purview of the VIX expiration within its own CFER, CBOE was able to ensure that manipulation surrounding the VIX expiration would not be detected by a third-party regulatory organization such as FINRA or the NFA.

56. Along similar lines, FINRA has the capabilities to conduct cross-market surveillance which, in theory, would have detected the VIX manipulation that, by its very nature, involves two distinct markets: (a) the affected market for VIX Instruments, and (b) the market for S&P 500 options market which is used to manipulate the SOQ settlement value for the VIX Instruments. However, CBOE did not enter into the FINRA RSA until January 2015, and even then, any effort by FINRA to use its cross-market surveillance to detect cross-market manipulation of the VIX was effectively neutered by weaknesses in CBOE’s CFER. For instance, according to a June 24, 2016 oversight report from the Commodity Futures Trading Commission (“CFTC”), CBOE’s CFER had significant weaknesses in its ability to monitor market manipulation, including “[a] considerable amount of staff turnover during the target period [of March 1, 2014 to February 28, 2015 that] prevented the Exchange from maintaining,

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<sup>22</sup> See “CFE Regulation,” CBOE, <http://www.cboe.com/aboutcboe/legal-regulatory/departamental-overviews/cfe-regulation> (last accessed Mar. 16, 2018).

on a consistent basis, sufficient compliance staff to conduct and complete investigations in a timely manner.”<sup>23</sup>

57. Regardless of CBOE’s failures with respect to enabling detection of the ongoing manipulation, CBOE itself has acknowledged that “[n]otwithstanding that the CBOE has entered into an RSA with a regulatory services provider, such as FINRA or NFA, to provide regulatory services, the CBOE retains ultimate legal responsibility for, and control of, its self-regulating responsibilities.”<sup>24</sup> CBOE, therefore, bears ultimate responsibility for its own failures to employ adequate surveillance systems to detect, investigate, and appropriately sanction the VIX manipulation that was occurring.

58. In the rare instances it has identified and sanctioned abusive market practices related to VIX Instruments, CBOE nonetheless imposed toothless sanctions that did little to deter or adequately punish wrongdoers given the severity of the conduct. For example, Equitec Proprietary Markets LLC, a Chicago-based trading firm and CBOE-designated market maker, was found by the CBOE’s Business Conduct Committee in April 2017 to have submitted manipulative orders in the constituent SPX options used in the VIX settlement calculation. Equitec submitted buy-side SPX orders on constituent options after the applicable cutoff time of 8:15 a.m. CST, which improperly modified a previously submitted strategy order on the same options, which was then used in the calculation of the October 2013 VIX settlement. Rather than suspend Equitec or investigate further, CBOE instead opted to censure Equitec and fine it \$50,000, a sum that pales in comparison to the profit made off of the alleged manipulation.

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<sup>23</sup> See Trade Practice Rule Enforcement Review of the CBOE Futures Exchange, <http://www.cftc.gov/idc/groups/public/@iodcms/documents/file/rercboefutures062416.pdf> at 8 (last accessed Mar. 16, 2018).

<sup>24</sup> See sr-cfe-2017-016.

## II. DEFENDANTS CONSPIRED TO FIX THE PRICES OF VIX INSTRUMENTS

59. The method by which VIX is calculated is particularly vulnerable to manipulation. Simply put, if a VIX trader is long VIX futures, he can push the VIX up by buying out-of-the-money SPX options. Likewise, if he is short VIX futures, he can push the settlement down by colluding with other VIX traders to sell or write out-of-the-money SPX Options. Although market participants can enter into trades of SPX options for legitimate purposes, a variety of emerging information indicates that such trades have often been executed manipulatively by the John Doe Defendants, including by the John Doe Defendants acting in concert.

60. Essentially, the parties manipulating VIX ( John Doe Defendants) use the access granted to them by CBOE as CBOE-authorized “market makers” in the S&P 500 options market to collude amongst themselves to affect the VIX Index calculation, resulting in the VIX settlement occurring at an artificial price.

61. In recent years, market participants, journalists, and academics have suggested that the VIX is indeed being manipulated by certain players to the detriment of others. Significantly, in May 2017, Professor John Griffin of the McCombs School of Business at The University of Texas Austin, along with then-PhD candidate at the McCombs Business School, Amin Shams, published a research paper (the “Griffin Paper”) titled *Manipulation in the VIX?*

62. The Griffin Paper made several key findings: (1) at the exact time of the monthly VIX settlement, highly statistically significant trading volume spikes occur in underlying SPX options; (2) the spikes occur only in out-of-the-money SPX options — those utilized for the VIX settlement calculation — and more so for those with greater influence on the calculation; (3) there is no spike in volume for the similar S&P 100 Index or in S&P 500 Exchange Traded

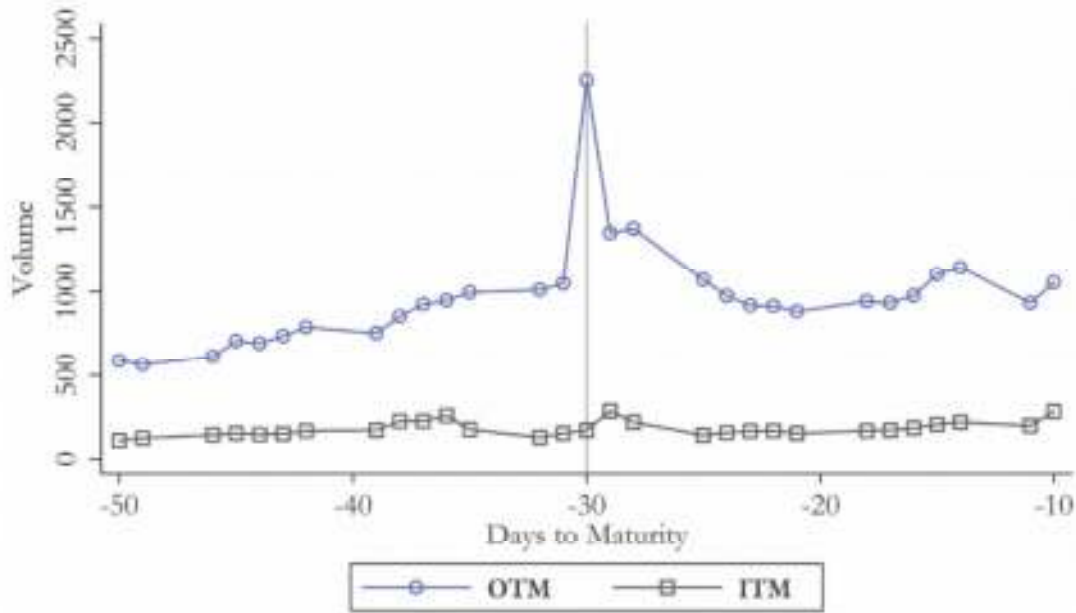


Fund options, which are not connected to the VIX; and (4) traders manipulated the settlement by optimally spreading their trades across the SPX option strikes and increasing the number of trades in deep out-of-the-money put options consistent with the VIX formula, despite such options rarely being traded otherwise.

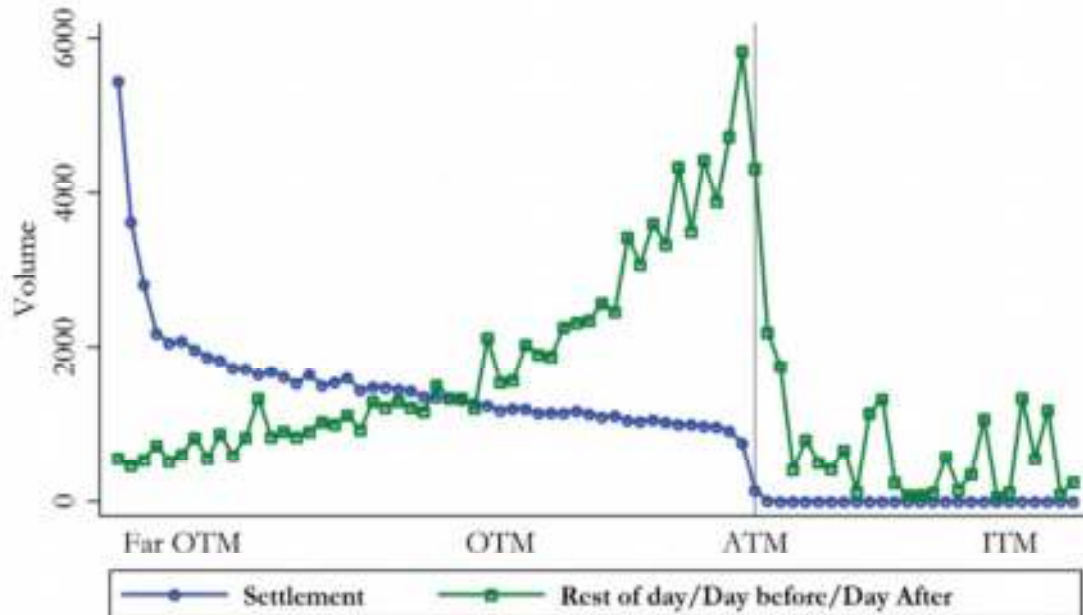
63. According to the Griffin Paper, the steps required for a trader to manipulate the VIX settlement are as follows: (1) open long positions in the VIX derivatives prior to settlement; (2) submit aggressive buy or sell orders in the SPX options during the settlement auction, thereby causing the auction-clearing prices of SPX options, and by extension, the VIX settlement price to rise or fall; and (3) obtain the higher or lower price desired for the VIX Futures or Options when they settle. Traders colluding with one another can manipulate the VIX either up or down without the risk that counteracting market movements will offset or negate their gains.

64. Analyzing trade data from January 2008 through April 2015, the Griffin Paper's findings suggest that traders deliberately engaged in trading activity designed to push the settlement price both up and down. For example, in months where the trading pushes the VIX settlement price up, the prevailing price of the VIX-influencing options will jump during the SOQ auction, peak at around 8:15 a.m. (*i.e.*, the deadline for VIX-related bids to be accepted for the SOQ prior to January 2017), and then drop seconds after the auction ends, when SPX Options revert to normal trading patterns.

65. The Griffin Paper also found that that “at the exact time of monthly VIX settlement [for VIX Futures and VIX Options], highly statistically and economically significant trading volume spikes occur in the underlying SPX options” and that the “spike occur only in the OTM [or out-of-the-money] SPX options that are included in the VIX [S]ettlement [Price] calculation and not in the excluded in-the-money (ITM) SPX options”:



66. Tellingly, the spike in out-of-the-money SPX Options during the settlement window occurs principally in (otherwise) rarely traded SPX Options that are priced the furthest out-of-the-money, and have a significant manipulative impact on the VIX Settlement Price:



67. Strong evidence of collusion is available by looking at fluctuations between (a) the VIX benchmark at the day's prior close, (b) the SOQ settlement value, and (c) the VIX

benchmark at the open of the day immediately following the SOQ calculation window – and, most importantly, through the direction in which the VIX was manipulated.

68. It is substantially more difficult to manipulate the VIX downward independently because it requires selling out-of-the-money puts during the SOQ calculation window. Manipulators must use significant amounts of money and have sufficient margin limits to write and sell SPX Options cheaply themselves. Thus, doing so requires multiple large institutional players, and could only be achieved by SPX Options market makers and others acting in concert, where if any one of them was not cooperating, the entire enterprise would fail and the SPX Options market makers would incur significant losses.<sup>25</sup>

69. A review of recent VIX data and SOQ prices in fact shows just this type of manipulation. During the proposed Class Period, there are multiple instances of the SOQ having a lower value than both the previous day's close of the VIX and the opening of the VIX immediately after the SOQ. Remarkably, in some instances, the SOQ was pushed lower right before the opening of the VIX even when the VIX opened higher than it closed at the day before. In addition, the value of the SOQ, through the activity of SPX Options market makers and others, repeatedly settled at a value that was outside the entire range of the VIX both on the day before the SOQ and the same day of the SOQ. These repeated anomalous settlement values could have only occurred through multiple parties acting in concert to trade at artificial prices.

70. For example, on March 19, 2013, the VIX closed at 14.39. By the next day, on March 20, 2013, based on activity in just the relatively illiquid SPX Options market, the SOQ was 12.64, a decrease of 12.16%. Upon the VIX opening immediately after the SOQ that same

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<sup>25</sup> See Griffin Paper at 9 n.12.

day, however, the VIX had returned to 13.18, representing a 4.27% increase from the SOQ value.<sup>26</sup>

71. On April 20, 2016, there was similar behavior indicative of collusion to drive down the SOQ. On April 19, 2016, the VIX closed at 13.24. By settlement on the morning of April 20, 2016, the SOQ was 12.38, a decrease of 6.5%. Upon the opening of the VIX immediately after the SOQ, however, the VIX had jumped back up to 13.39, representing an 8.16% increase from the SOQ value, and in fact, higher than the previous day's close.<sup>27</sup>

72. On September 20, 2016, the VIX closed at 15.92. By settlement the following morning, September 21, 2016, the SOQ was 14.92, a decrease of 6.28%. At the opening of the VIX immediately after, however, the VIX was 15.07, representing a 1.01% increase from the SOQ value.<sup>28</sup>

73. On October 18, 2016, the VIX closed at 15.28. By settlement the following morning, October 19, 2016, the SOQ was 14.56, a decrease of 4.7%. At the opening of the VIX immediately after, however, the VIX had not only returned to its prior closing level, it was higher at 15.45, representing a 6.1% increase from the SOQ value.<sup>29</sup>

74. Again, on December 19, 2017, the VIX closed at 10.03. By settlement the following morning, December 20, 2017, the SOQ was 8.75, a decrease of 12.76%. Upon the

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<sup>26</sup> See "VIX data for 2004 to present (Updated Daily)," VIX Options and Futures Historical Data, CBOE, <http://www.cboe.com/products/vix-index-volatility/vix-options-and-futures/vix-index/vix-historical-data> (last accessed Mar. 16, 2018); Index Settlement Values, <http://www.cboe.com/data/historical-options-data/index-settlement-values> (last accessed Mar. 16, 2018).

<sup>27</sup> *Id.*

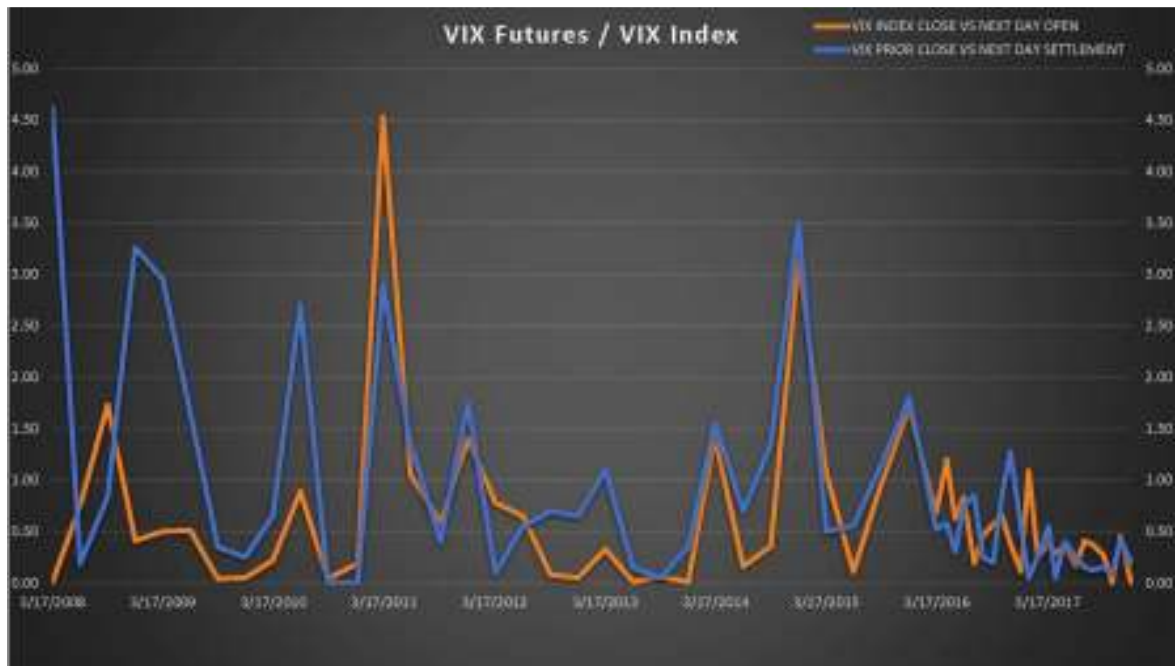
<sup>28</sup> *Id.*

<sup>29</sup> *Id.*

VIX opening immediately after the SOQ that same day, however, the VIX had returned to 9.69, representing a 10.74% increase from the SOQ value.<sup>30</sup>

75. Finally, on February 13, 2018, the VIX closed at 24.97. By settlement the following morning, February 14, 2018, the SOQ was 21.87, a decrease of 12.41%. Upon the VIX opening immediately after the SOQ, however, the VIX had moved upwards 23.48, representing a 7.36% increase from the SOQ value.<sup>31</sup>

76. A further analysis of sample data provided by CBOE to cross-check the Griffin Paper shows signs of manipulation. For example, it can be observed that, in multiple instances, VIX Futures do not converge to the spot index at the Futures' expiration. This runs counter to what would be observed in a normally functioning, "clean" market. Not surprisingly, publication of the incriminating article caused the behavior of Defendants to alter and for there to be more (although still not perfect) convergence:



<sup>30</sup> *Id.*

<sup>31</sup> *Id.*

77. This type of manipulation contrary to both the pre-SOQ period closing and post-SOQ opening VIX levels requires multiple traders working in collusion, including at least some SPX Option market makers to drive down SPX options prices. Furthermore, it can be effectuated only as a result of CBOE's intentional decisions with respect to the calculation of the VIX and the SOQ, and CBOE's determination as to which firms get to participate as market makers in SPX Options and thus have the most influence over trades that impact the SOQ calculation.

### **III. VIX, VIX INSTRUMENTS, AND THE VIX SETTLEMENT PROCESS ARE INTENTIONALLY MADE VULNERABLE TO COLLUSION**

78. Timothy Klassen, a member of the Goldman Sachs team that assisted CBOE in the development of the VIX, said that "trying to manipulate the VIX is not conceptually different from trying to manipulate any other index" that is dependent on underlying financial contracts.<sup>32</sup>

79. Market makers could collude and prearrange trades in order to manipulate the VIX settlement. Without collusion from the major players, the VIX could not be manipulated downward with any significant degree of frequency or to any substantial effect.

80. The market for VIX Instruments is large and liquid, which enables traders to invest in a significant position that could benefit from a manipulated settlement. In contrast, many of the SPX options are illiquid. The Griffin Paper found that "the size of VIX futures with open interest at settlement is on average 5.7 times the size SPX options traded at settlement, and it is 7.3 times for VIX options that are in-the-money at settlement."<sup>33</sup> As such, traders with a large position in VIX Futures (either through VIX ETPs or the VIX Futures themselves) could

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<sup>32</sup> See Elliot Blair Smith, "How S&P 500 options may be used to manipulate VIX 'fear gauge,'" MARKETWATCH (June 19, 2017), <https://www.marketwatch.com/story/how-sp-500-options-may-be-used-to-manipulate-vix-fear-gauge-2017-06-19> (last accessed Mar. 16, 2018).

<sup>33</sup> Griffin Paper at 32.

profit disproportionately in this position by collusively trading and/or making markets in relatively smaller dollar value in SPX Options. In particular, manipulators working together can trade a strip of deep out-of-the-money SPX put Options (which have mechanically higher weighting than calls in the VIX formula), or set the market for those Options at predetermined levels, in order to drive the VIX settlement price higher by including these options in the calculation at a relatively *de minimis* cost and with little or no risk.

81. CBOE did not, however, always use out-of-the-money SPX Options in its VIX calculation. Prior to 2003, CBOE only used at-the-money and near-the-money strikes to determine VIX.<sup>34</sup> In 2003, CBOE redesigned the VIX calculation in consultation with Goldman Sachs.<sup>35</sup> As part of that redesign, CBOE included out-of-the-money strikes in its VIX calculation while also switching to use of the S&P 500 Index rather than the S&P 100 Index.

82. VIX Futures and Options are also prone to manipulation because they are cash settled.<sup>36</sup> As a result, if the VIX settlement value deviates from its true value, the VIX position will automatically be cashed out at the deviated price. By contrast, futures contracts of a physical asset (*e.g.*, cattle, oil) have the opportunity to opt for physical delivery of the asset upon

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<sup>34</sup> Calculations are still made using this old methodology, under the ticker VXO. *See* “VIX data for 2004 to present (Updated Daily),” VIX Options and Futures Historical Data, CBOE, <http://www.cboe.com/products/vix-index-volatility/vix-options-and-futures/vix-index/vix-historical-data> (last accessed Mar. 16, 2018). *See also* CBOE S&P 100 Volatility Index – VXO, <http://www.cboe.com/products/vix-index-volatility/volatility-on-stock-indexes/cboe-s-p-100-volatility-index-vxo> (last accessed Mar. 16, 2018). *See also* Peter Carr and Liuren Wu, “A Tale of Two Indices,” THE JOURNAL OF DERIVATIVES (2006), <http://faculty.baruch.cuny.edu/lwu/papers/vix.pdf> (last accessed Mar. 16, 2018).

<sup>35</sup> *See* Felix Goltz, Renata Guobuzaitė, and Lionel Martellini, “Introducing a New Form of Volatility Index: The Cross Sectional Volatility Index,” EDHEC BUSINESS SCHOOL (Jan. 2011), [http://www.edhec-risk.com/edhec\\_publications/all\\_publications/RISKReview.2012-05-14.0334/attachments/EDHEC\\_Working\\_Paper\\_Introducing\\_a\\_New\\_Form\\_of\\_Volatility\\_Index\\_F.pdf](http://www.edhec-risk.com/edhec_publications/all_publications/RISKReview.2012-05-14.0334/attachments/EDHEC_Working_Paper_Introducing_a_New_Form_of_Volatility_Index_F.pdf) (last accessed Mar. 16 2018).

<sup>36</sup> Griffin Paper at 9.

settlement. Even if the asset in question was trading at an inflated price, after the manipulative trader receives delivery of the asset, the price of that asset may quickly fall to the original — or actual market — value when the manipulator attempts to exit the position. As such, cash-settled instruments create an adverse incentive and are generally easier to manipulate.

83. Another aspect of the VIX settlement calculation that makes VIX Instruments vulnerable to manipulation is that settlement occurs based on a special opening value generated in a single narrow window that is outside of normal trading hours. That combination means that a single manipulative trade can have a significant influence on the settlement calculation. Furthermore, trading in a narrow window outside of normal trading hours means that the John Doe Defendants do not have to defend their manipulative trades over a longer period of time against market forces present during normal trading hours. If the SOQ settlement window was longer and during normal market hours, the John Doe Defendants would have difficulty reaping their ill-gotten gains.<sup>37</sup>

84. An additional aspect of the VIX settlement calculation that makes VIX Instruments vulnerable to manipulation is that there is a relatively *de minimis* 0.05 per option contract threshold for an SPX Option to be included in the settlement calculation. Combined with the ability to manipulate the VIX settlement calculation during only a single, relatively narrow window, Defendants can manipulate large positions in VIX Instruments cheaply and easily through SPX Options.

85. CBOE purposefully crafted its SOQ calculation methodology for the VIX settlement in such a way that it was readily susceptible to manipulation, even as other, near-equivalent indices selected settlement calculations which included additional safeguards designed to prevent manipulation. For example, the VSTOXX index, which is a European

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<sup>37</sup> *Id.*



volatility index equivalent to the VIX and is traded through options and futures, does not use a single opening price. Instead, settlement of VSTOXX options and futures is based on the average of VSTOXX values calculated every five seconds over the course of a 30-minute trade window. In addition, VSTOXX options and futures are settled only using trades that have a premium of at least 0.5 euros. As a consequence, anyone wishing to manipulate the VSTOXX has to maintain the price discrepancy for a longer period of time at a higher cost, and at greater risk than they need to in order to manipulate the VIX.

86. Furthermore, the VSTOXX final settlement price is established by the Eurex Exchange. The final settlement price is the average of the VSTOXX index values calculated every five seconds over the course of 30 minutes from 11:30-12:00 CET. *The calculation occurs during normal market trading hours.* In contrast, the VIX futures settlement occurs during an SOQ period *prior to the opening of the market*, which renders it much more prone to collusive manipulation by a small number of SPX Options traders and market makers.

87. The fact that VSTOXX is calculated as an average of the VSTOXX index values during normal market trading means that its value *by definition* always falls within and between the intraday high and low of VSTOXX on the settlement day. By contrast, the SOQ has, on 12 separate occasions since January 2012 – or 16.2% of the total 74 SOQ settlements in that time period – settled at a value *outside of* the intraday VIX highs/lows for *both* the day before the SOQ *and* the day of the SOQ – indicating a high susceptibility to and likelihood of coordinated manipulation of the SOQ settlement by SPX Options traders and market makers during the SOQ window:

SOQ Date	Day Before High	Day Before Low	SOQ Value	SOQ Day High	SOQ Day Low	Percent Outside Closest Limit
12/20/2017	10.15	9.18	8.75	9.85	8.9	-1.69%
10/18/2017	10.46	9.78	10.53	10.41	9.87	0.67%
8/16/2017	12.37	11.45	12.95	12.54	11.25	3.27%
2/15/2017	11.34	10.73	12.26	12.01	10.8	2.08%
11/16/2016	14.65	13.3	14.76	14.49	13.51	0.75%
4/20/2016	13.88	12.98	12.38	13.5	12.5	-0.96%
1/22/2014	13.42	12.61	12.36	13.12	12.55	-1.51%
11/20/2013	13.68	12.88	14.12	13.94	12.97	1.29%
9/18/2013	14.61	14.28	14.77	14.68	13.23	0.61%
6/19/2013	16.95	16.46	17.22	17.18	15.36	0.23%
10/17/2012	15.23	14.5	15.96	15.63	14.9	2.11%
1/18/2012	22.25	20.69	23.64	23.44	20.78	0.85%

88. Tellingly, the VIX futures volume is approximately double the VSTOXX futures volume. VIX futures have about 70% more open interest:



89. The John Doe Defendants also take advantage of the fact that, in the event there is no opening trade, CBOE uses the average of the bid and the ask price for the SPX Option as

determined at the time of opening.<sup>38</sup> This permits Defendants in many instances to influence the VIX settlement calculation without even needing to use any capital.

90. CBOE effectively serves as the ringleader to this illicit activity, as it alone has created the environment in which this collusive conduct can occur. CBOE alone determines which firms are afforded market-making privileges in SPX Options, it alone determines the eligibility rules/requirements to be a market maker, and it alone shelters the identity of SPX Options market makers from public disclosure.<sup>39</sup> SPX Options market makers pay additional revenue to CBOE and/or receive commission discounts and other trading privileges by virtue of their respective roles as market makers. Upon information and belief, some or all SPX Options market makers are John Doe Defendants.

91. CBOE's decisions to: (a) incorporate out-of-the-money SPX Options in the VIX settlement calculation; (b) give greater weight to certain SPX Options; (c) not require a premium threshold for SPX Options to be included in the settlement calculation; (d) base the SOQ on a single opening price; (e) sometimes use a special opening price based not on actual trades but solely on bid-ask spreads; and (f) grant SPX Options market-making privileges to some or all of the same institutions engaging in collusive and manipulative conduct are all indicative of CBOE's intent to facilitate manipulation and collusion of VIX Instruments.

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<sup>38</sup> See VIX Special Opening Quotation (SOQ), Macroption, <http://www.macroption.com/vix-soq/> (last accessed Mar. 16, 2018).

<sup>39</sup> See CBOE Trading Permit Holder Forms Library, <https://www.cboe.org/general-info/trading-permit-holder-forms> (last accessed Mar. 16, 2018). See also Trading Permits, <http://cfe.cboe.com/trade-cfe/trading-permits> (last accessed Mar. 16, 2018). See also Rules of CBOE Exchange, Inc., <http://www.cboe.com/publish/cboe-rules/cboe-exchange-inc-rule-book.pdf> (last accessed Mar. 16, 2018). See also CBOE Futures Exchange, LLC Rulebook <https://cfe.cboe.com/publish/cferulebook/cfe-rule-book.pdf> (last accessed Mar. 16, 2018).

#### IV. INVESTIGATIONS AND COMPLAINTS

92. On February 5, 2018, the Dow Jones Industrial Average had its biggest ever one-day point decline. As a consequence, the VIX increased 116% that day alone.<sup>40</sup>

93. This dramatic increase in the VIX led to massive losses in VIX ETPs, especially inverse ETPs that are negatively correlated to the VIX. This VIX movement triggered rules that halted trading in nearly a dozen ETPs.<sup>41</sup> For example, Credit Suisse's VelocityShares Daily Inverse VIX Short-Term ETN (trading under the symbol XIV) had an opening price on February 5, 2018 of \$108.37, representing a total value of at least \$1.63 billion (and perhaps as much as \$1.8 billion) according to contemporaneous reports.<sup>42</sup> According to a February 9, 2018 article by Matt Levine, a columnist for Bloomberg and former investment banker at Goldman Sachs, "[o]ver the next two days [XIV's] value declined by 95 percent, to an indicative value of \$80 million at the close of trading on Tuesday [February 6]."<sup>43</sup> This resulted from the above-mentioned 116% increase in the VIX on February 5, which caused a corresponding inverse

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<sup>40</sup> See Julia Horowitz and Matt Egan, "Market fear is back in a big way," CNN MONEY (Feb. 5, 2018), <http://money.cnn.com/2018/02/05/investing/vix-volatility-index-dow/index.html> (last accessed Mar. 16, 2018).

<sup>41</sup> See Jan-Henrik Foerster and Rachel Evans, "Credit Suisse Fund Liquidated, ETFs Halted as Short-Vol Bets Die," BLOOMBERG MARKETS (Feb. 6, 2018), <https://www.bloomberg.com/news/articles/2018-02-06/credit-suisse-is-said-to-consider-redemption-of-volatility-note> (last accessed Mar. 16, 2018).

<sup>42</sup> See Thomas Frank, "Obscure security linked to stock volatility plummets 80% after hours, sparking worries of bigger market effect," CNBC (Feb. 5, 2018), <https://www.cnbc.com/2018/02/05/xiv-exchange-traded-security-linked-to-volatility-plummets-80-percent.html> (last accessed Mar. 16, 2018); Landon Thomas Jr., "Volatility rattles stocks, and investors who bet on continuing calm," THE NEW YORK TIMES (Feb. 6, 2018), <https://www.nytimes.com/2018/02/06/business/stock-market-volatility.html> (last accessed Mar. 16, 2018); Velocity Shares Pricing Supplement *issued by* Credit Suisse AG (Jan. 29, 2018), [http://app.velocitysharesetns.com/files/prospectus/CS\\_VIX\\_VelocityShares\\_ETN\\_Amended\\_Final\\_Pricing\\_Supplement\\_AR48\\_long\\_form\\_2.PDF](http://app.velocitysharesetns.com/files/prospectus/CS_VIX_VelocityShares_ETN_Amended_Final_Pricing_Supplement_AR48_long_form_2.PDF) (last accessed Mar. 16, 2018).

<sup>43</sup> See Matt Levine, "Inverse Volatility Products Almost Worked," BLOOMBERG VIEW (Feb. 8, 2018), <https://www.bloomberg.com/view/articles/2018-02-09/inverse-volatility-products-almost-worked> (last accessed Mar. 16, 2018).

decline in XIV, and led Credit Suisse to announce that it would liquidate XIV in a termination cash payout on February 21, 2018 at a price of \$6.04 per share, or about \$90 million in total value.<sup>44</sup> Taken together, this equates to a total decrease of at least \$1.54 billion in XIV's value, and an equivalent loss to investors.

94. On February 12, 2018, an anonymous whistleblower who “has held senior positions at some of the largest investment firms in the world,” reported to the Securities and Exchange Commission and the Commodity Futures Trading Commission widespread manipulation of VIX. The whistleblower asserted that a “pervasive flaw” introduced by CBOE permits “trading firms with sophisticated algorithms to move the VIX up or down by simply posting quotes on [SPX Options] and without needing to physically engage in any trading or deploying any capital.” The whistleblower speculated that the collapse in certain VIX derivatives like XIV was partially the result of market manipulation of the VIX.

95. The whistleblower identifies SPX Options market makers as the entities best positioned to avail themselves of these manipulative trading practices. This is the case not only because they have the resources necessary to engage in the sophisticated manipulation easily, but also because they are uniquely positioned to set prices on SPX Options used in the VIX settlement calculation. This effect is magnified when the opening price to determine the SOQ is not based on an actual trade, but rather a bid-ask spread.

96. The whistleblower letter, along with the Griffin Paper and the above-referenced February 2018 market disruption, has spawned multiple investigations. Some of these

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<sup>44</sup> See Lawrence McMillan, “XIV: the scapegoat of the market’s decline,” SEEKING ALPHA (Mar. 2, 2018), <https://seekingalpha.com/article/4155721-xiv-scapegoat-markets-decline> (last accessed Mar. 16, 2018); “Credit Suisse AG Announces Event Acceleration of its XIV ETNs,” CREDIT SUISSE AG (Feb. 6, 2018), <https://www.credit-suisse.com/corporate/en/articles/media-releases/credit-suisse-announces-event-acceleration-xiv-etn-201802.html> (last accessed Mar. 16, 2018).

investigations encompass not only specific ETPs or ETPs generally, but also broader inquiries into widespread manipulation of the VIX itself as alleged herein.

97. On February 13, 2018, both the *Wall Street Journal* and the *Financial Times* reported that the Financial Industry Regulatory Authority (FINRA), is examining whether prices linked to the VIX have been manipulated.

98. On February 23, 2018, *Bloomberg* reported that both the Securities and Exchange Commission and the Commodities Futures Trading Commission “have been conducting a broad review of trading since February 5, 2018 when volatility spiked and investors lost billions of dollars.” The *Bloomberg* article also notes that because of the substantial investor losses arising from recent market events, “allegations of market manipulation are getting more attention and government watchdogs face questions about why small-time investors were permitted to buy such products in the first place.”

99. Former regulators of both the SEC and the CFTC have also weighed in, making public statements indicating their belief that the settlement of VIX Instruments has been, or is being, manipulated. Former CFTC Commissioner, Bart Chilton, was quoted by CNBC on February 14, 2018, saying that VIX manipulation “rings true to me” and that “there’s certainly enough smoke” to warrant scrutiny of possible VIX manipulation.<sup>45</sup> On February 16, 2018, former SEC Chairman, Harvey Pitt, was quoted as saying that while “a product like VIX [Instruments] could be valuable to institutional investors who want to hedge against a precipitous drop in the market . . . it’s quite clear that these indexes’ options can be manipulated. And when

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<sup>45</sup> See Matthew Belvedere, “Former CFTC Commissioner: Whistleblower allegation about volatility index manipulation ‘rings true,’” CNBC (Feb. 14, 2013), <https://www.cnbc.com/2018/02/14/ex-cftc-head-bart-chilton-on-whistleblower-vix-manipulation-allegation.html> (last accessed Mar. 16, 2018).

there were complaints about possible manipulation, CBOE, as the marketplace, should have sprung into action.”<sup>46</sup>

100. Despite the Griffin Paper, the whistleblower letter, the announcement of FINRA/SEC/CFTC investigations, and comments from former Commissioner Chilton and former Chairman Pitt indicating their susceptibility to manipulation and likelihood that they have been manipulated, CBOE continues to allow trading in VIX Futures and VIX Options (as well as VIX ETPs based on those VIX Futures).

## **V. PLAINTIFF AND THE CLASSES SUFFERED ANTITRUST INJURY**

101. Defendants injured Plaintiff and Class members by manipulating the prices of VIX Instruments. The pricing of VIX Instruments is based on fundamental market forces of supply and demand. Specifically, the prices of VIX Instruments are inherently based on the VIX and the VIX SOQ. Defendants understood that they could directly or indirectly manipulate the prices of VIX Instruments through the manipulation of the VIX.

102. Defendants’ combination, conspiracy, and/or agreement to manipulate the prices of VIX Instruments harms competition in the market for VIX Instruments in the United States. Absent the John Doe Defendants’ collusion with each other and CBOE – which allowed the manipulation to continue, and failed to take steps to prevent it or stop it once it was apparent that it was occurring – those transacting in VIX Instruments would have transacted at competitive prices and reaped the benefits of competitive VIX settlement calculations. No one Defendant could accomplish systematic and continuing manipulation of VIX and the VIX settlement process without coordinating with its rivals. Absent an agreement not to compete, the conduct

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<sup>46</sup> See Mark DeCambre, “Ex-SEC chairman says ‘it’s quite clear’ Wall Street’s ‘fear gauge’ can be manipulated,” MARKETWATCH (Feb. 16, 2018), <https://www.marketwatch.com/story/ex-sec-chairman-says-its-quite-clear-wall-streets-fear-gauge-can-be-manipulated-2018-02-16> (last accessed Mar. 16, 2018).

alleged herein would be a risky strategy because market makers and swaps dealers would almost certainly be similarly positioned to profit from manipulation going into the settlement. Defendants benefited from coordinating their market activities.

103. Defendants' collusion caused VIX Instruments to trade at artificial prices. Defendants' unlawful conduct deprives Plaintiff and Class members who transact in VIX Instruments of a competitive marketplace and exposes them to artificial volatility. The harm Plaintiff and the Class members have suffered is quantifiable. The added costs to Plaintiff and the Class members incurred due to Defendants' anticompetitive conduct results in artificial prices charged to investors in VIX Instruments.

104. Plaintiff and the Class members are suitable plaintiffs for pursuing antitrust violations by Defendants, insofar as they transacted in VIX Instruments during the Class Period, and thus were harmed by Defendants' anticompetitive conduct.

105. As a direct, intended, foreseeable, and proximate result of Defendants' unlawful conspiracy and acts in furtherance of their conspiracy, Plaintiff and Class members have been injured in their business and property, in violation of federal antitrust laws. The injury to Plaintiff and Class members is the type the antitrust laws were designed to prevent and directly flows from Defendants' unlawful anticompetitive conduct.

## **VI. DEFENDANTS FRAUDULENTLY CONCEALED THEIR MANIPULATION**

106. Any applicable statute of limitations has been tolled by Defendants' knowing and active concealment of their manipulation of the prices of VIX Instruments. Through no fault or lack of diligence, Plaintiff and Class members were deceived regarding Defendants' manipulation of the prices of VIX Instruments and could not reasonably discover the manipulation.



107. As alleged herein, Defendants' manipulation of the prices of VIX Instruments was material to Plaintiff and Class members at all relevant times. Within the time period of any applicable statutes of limitations, Plaintiff and Class members could not have discovered through the exercise of reasonable diligence that Defendants were manipulating the prices of VIX Instruments, in part because the trading records and roster of SPX market makers are concealed.

108. Plaintiff and Class members did not discover and did not know of any facts that would have caused a reasonable person to suspect that Defendants were manipulating the prices of VIX Instruments.

109. Defendants knowingly, actively, and affirmatively concealed the facts alleged herein, including their manipulation of the prices of VIX Instruments. Plaintiff and Class members reasonably relied on Defendants' knowing, active, and affirmative concealment. Thus, all applicable statutes of limitation have been tolled based on the discovery rule and Defendants' fraudulent concealment, and Defendants are estopped from relying on any statutes of limitations.

### **CLASS ACTION ALLEGATIONS**

110. Plaintiff brings this action under Federal Rules of Civil Procedure 23(a) and 23(b)(1), (b)(2), and (b)(3) on behalf of himself and all members of the Proposed Classes:

#### **VIX FUTURES AND OPTIONS CLASS**

All persons who traded VIX Futures or Options in the United States on or after January 1, 2009; and

#### **VIX EXCHANGE-TRADED PRODUCTS CLASS**

All persons who traded VIX ETPs on an exchange in the United States on or after January 1, 2009.

111. Excluded from the Classes are Defendants; the officers, directors, or employees of any Defendant; any entity in which any Defendant has a controlling interest; any affiliate, legal

representative, heir, or assign of any Defendant and any person acting on their behalf. Also excluded from the Classes are any judicial officers presiding over this action and the members of his/her immediate family and judicial staff, and any juror assigned to this action.

112. The Classes are readily ascertainable and are ones for which records should exist, including, specifically, Defendants' records and transaction data.

113. Due to the nature of the trade and commerce involved, Plaintiff believes that there are thousands of geographically dispersed Class members, the exact number and their identities being known to Defendants, or capable of identification via third parties.

114. Plaintiff's claims are typical of the claims of the members of the Classes. Plaintiff and members of the Classes sustained damages arising out of Defendants' common course of conduct in violation of the laws alleged herein. The damages and injuries of each member of the Classes were directly caused by Defendants' wrongful conduct.

115. There are questions of law and fact common to the Classes, including, but not limited to, the following:

- whether John Doe Defendants engaged in a conspiracy with each other to manipulate the prices of VIX Instruments;
- whether CBOE engaged in a conspiracy with the John Doe Defendants to manipulate the prices of VIX Instruments;
- whether Defendants' conduct is a *per se* violation of Section 1 of the Sherman Act;
- whether Defendants' conduct constitutes manipulation under the CEA;
- the identity of the John Doe Defendants in the conspiracy; and
- the appropriate class-wide measure of damages.

116. Plaintiff will fairly and adequately protect the interests of the members of the Classes. Plaintiff's interests are aligned with, and not antagonistic to, those of the other members

of the Classes, and Plaintiff has retained counsel competent and experienced in the prosecution of class actions and financial litigation to represent himself and the Classes.

117. Questions of law or fact that are common to the members of the Classes predominate over any questions affecting only individual members of the Classes.

118. A class action is superior to other available methods for the fair and efficient adjudication of this controversy. The prosecution of separate actions by individual members of the Classes would impose heavy burdens on the courts and Defendants and would create a risk of inconsistent or varying adjudications of the questions of law and fact common to the Classes. A class action, on the other hand, would achieve substantial economies of time, effort, and expense and would assure uniformity of decision as to persons similarly situated without sacrificing procedural fairness or bringing about other undesirable results. Absent a class action, it would not be feasible for the vast majority of the members of the Classes to seek redress for the violations of law alleged herein.

### **CLAIMS FOR RELIEF**

#### **CLAIM ONE**

#### **Violation of §1 of the Sherman Act, 15 U.S.C. §1 (Against All Defendants by both the VIX Futures and Options Class and the VIX ETP Class)**

119. Plaintiff repeats and incorporates by reference each of the foregoing allegations of this Complaint.

120. Beginning at least as early as January 1, 2008, and continuing through the present, the exact dates being unknown to Plaintiff, Defendants entered into and engaged in a conspiracy in unreasonable restraint of trade in violation of Section 1 of the Sherman Act, 15 U.S.C. §1.

121. Plaintiff alleges a contract, combination, or conspiracy exists between or among Defendants that unreasonably restrains and/or eliminates trade. The conspiracy consisted of a

continuing agreement, understanding, or concerted action between and among Defendants and their co-conspirators in furtherance of which Defendants fixed, maintained, or made artificial prices related to VIX Instruments as alleged herein.

122. There is no legitimate business justification for, or procompetitive benefits caused by, Defendants' unreasonable restraint of trade. Any ostensible procompetitive benefit was pretextual or could have been achieved by less restrictive means.

123. Defendants' conspiracy is a *per se* violation of the Sherman Act and is, in any event, an unreasonable and unlawful restraint of trade. This contract, combination, or conspiracy had anticompetitive effects, as alleged herein.

124. As a direct, intended, foreseeable, and proximate result of Defendants' conspiracy and overt acts taken in furtherance thereof, Plaintiff has suffered injury to his business or property. The injury to Plaintiff and members of the Class are of the type the antitrust laws were designed to prevent and flow from that which makes Defendants' acts unlawful.

125. Defendants are engaged in commerce in the United States, and the anticompetitive conduct alleged herein involves VIX Instruments that are in the flow of interstate commerce and which will and has substantially impacted interstate commerce because VIX Instruments are traded by investors throughout the United States.

126. WHEREFORE, Plaintiff and the Class members request the Court to enter judgment in their favor against Defendants, jointly and severally, awarding all damages, in an amount to be proven at trial, costs, and such other relief as the Court deems appropriate and just.

**CLAIM TWO**

**Manipulation in Violation of the Commodity Exchange Act**  
**(Against John Doe Defendants by the VIX Futures and Options Class)**

127. Plaintiff repeats and incorporates by reference each of the foregoing allegations of this Complaint.

128. Each Defendant, individually, in concert, and/or as one another's control persons or agents, through their acts alleged herein, specifically intended to and did cause unlawful and artificial prices of VIX Futures and Options contracts in violation of the CEA, 7 U.S.C. §1, *et seq.*

129. The Defendants' manipulative conduct and trading activity alleged herein constituted a manipulation of the prices of VIX Instruments in violation of Section 4b(a), 4c(a), 9(a) and 22(a) of the CEA, 7 U.S.C. §§6b(a), 6c(a), 13(a)(2), and 25(a). As a direct result of Defendants' unlawful conduct, Plaintiff and members of the proposed Class have suffered actual damages and injury in fact due to artificial prices for VIX Instruments to which they would not have been subject but for the unlawful conduct alleged herein.

130. Plaintiff and members of the proposed Class were further legally injured and suffered injury in fact when they transacted VIX Instruments in an artificial and manipulated market operating under the artificial prices caused by the Defendants. Plaintiff and members of the proposed Class are each entitled to their actual damages for the violations of the CEA alleged herein.

**CLAIM THREE**

**Aiding and Abetting Manipulation in Violation of the Commodity Exchange Act**  
**(Against John Doe Defendants by the VIX Futures and Options Class)**

131. Plaintiff repeats and incorporates by reference each of the foregoing allegations of this Complaint.

132. John Doe Defendants by, *inter alia*, using VIX features introduced by CBOE and through the collusive posting of quotes and trading of SPX Options, knowingly aided, abetted, counseled, induced, and/or procured the violations of the CEA by other John Doe Defendants as alleged herein. The John Doe Defendants further coordinated their trading and market activity for the purposes of manipulating VIX Instruments.

133. Each John Doe Defendant did so knowing of the other John Doe Defendants' manipulation of the prices of SPX Options underlying the prices of VIX Instruments. The conduct alleged herein demonstrates that Defendants substantially and willfully intended to assist these manipulations so as to cause prices of VIX Instruments to be artificial, in violation of Section 22(a)(1) of the CEA.

134. Under Section 13c(a) of the CEA, 7 U.S.C. §13, Defendants are liable for willfully intending to assist the manipulation.

135. Other persons willfully intended to assist these manipulations to cause VIX Instruments to trade at artificial levels – the agents and unnamed co-conspirators as alleged herein – in violation of §22(a)(1) of the CEA, 7 U.S.C. §25(a)(1).

136. Plaintiff and members of the proposed Class are each entitled to actual damages sustained for the violations of the CEA alleged herein.

**CLAIM FOUR**  
**Manipulation by False Reporting and Fraud and Deceit in Violation**  
**of the Commodity Exchange Act**  
**(Against John Doe Defendants by the VIX Futures and Options Class)**

137. Plaintiff repeats and incorporates by reference each of the foregoing allegations of this Complaint.

138. Under Section 6(c)(1) of the CEA, as amended, codified at 7 U.S.C. §9, and Section 22 of the CEA, as amended, 7 U.S.C. §25, it is unlawful for any person, directly or

indirectly, to use or employ, or attempt to use or employ, in connection with any swap, or a contract of sale of any commodity in interstate commerce, or for future delivery on or subject to the rules of any registered entity, any manipulative or deceptive device or contrivance, in contravention of such rules and regulations as the CFTC shall promulgate.

139. In July 2011, the CFTC promulgated Rule 180.1(a), 17 C.F.R. §180.1(a) (2011), pursuant to Section (6)(c)(1), which provides, in relevant part:

It shall be unlawful for any person, directly or indirectly, in connection with any swap, or contract of sale of any commodity in interstate commerce, or contract for future delivery on or subject to the rules of any registered entity, to intentionally or recklessly:

- (1) Use or employ, or attempt to use or employ, any manipulative device, scheme, or artifice to defraud;
- (2) Make, or attempt to make, any untrue or misleading statement of a material fact or to omit to state a material fact necessary in order to make the statements made not untrue or misleading;
- (3) Engage, or attempt to engage, in any act, practice, or course of business which operates or would operate as a fraud or deceit upon any person; or
- (4) Deliver or cause to be delivered, or attempt to deliver or cause to be delivered for transmission through mails or interstate commerce, by any means of communication whatsoever, a false or misleading or inaccurate report concerning crop or market information or conditions that affect or tend to affect the price of any commodity in interstate commerce, knowing or acting in reckless disregard of the fact that such report is false, misleading or inaccurate.

140. Unlawful manipulation under the CEA, as amended, and Rule 180.1 includes delivering, or causing to be delivered for transmission through the mails or interstate commerce, by any means of communication whatsoever, a false or misleading or inaccurate report concerning market information or conditions that affect or tend to affect the price of any commodity in interstate commerce, knowing, or acting in reckless disregard of the fact that such report is false, misleading, or inaccurate.

141. During the Class Period, Defendants used or employed manipulative or deceptive devices or contrivances, in connection with a contract of sale or purchase of SPX Options and VIX Instruments in interstate commerce. This conduct included the making of untrue, inaccurate, or misleading statements of material facts, or omitting material facts necessary to make the statements made not misleading, such as the posting or bidding on of artificial prices for SPX Options in order to influence the prices of VIX Instruments, and failing to disclose that Defendants entered pre-arranged transactions to move the prices of VIX Instruments in a direction to benefit their own trading books.

142. Defendants' conduct caused injury to Plaintiff and other members of the Class who transacted in an artificial and manipulated market, at manipulated prices, and with artificial price trends, during the Class Period.

143. Plaintiff and other members of the Class are each entitled to damages for the violations of the CEA alleged herein.

**CLAIM FIVE**  
**Failure to Enforce Bylaws, Rules, Regulations, or Resolutions that It Is Required to**  
**Enforce in Violation of the Commodity Exchange Act**  
**(Against CBOE by the VIX Futures and Options Class)**

144. Plaintiff repeats and incorporates by reference each of the foregoing allegations of this Complaint.

145. Pursuant to 7 U.S.C. §25(b)(1), “[a] registered entity that fails to enforce any bylaw, rule, regulation, or resolution that it is required to enforce by section 7, 7a-1, 7a-2, 7b-3, or 24a of this title . . . [or] a licensed board of trade that fails to enforce any bylaw, rule, regulation, or resolution that it is required to enforce by the Commission . . . shall be liable for actual damages sustained by a person who engaged in any transaction on or subject to the rules of such registered entity to the extent of such person’s actual losses that resulted from such



transaction and were caused by such failure to enforce . . . such bylaws, rules, regulations, or resolutions.”

146. CBOE is a registered entity under the terms of 7 U.S.C. §1a(40).

147. Plaintiff and other members of the Class engaged in transactions of VIX Futures and VIX Options subject to the rules of CBOE.

148. As detailed in the Complaint above, as a registered entity, CBOE knowingly failed to enforce (and/or with reckless disregard of its rules/regulations avoided acquiring such knowledge necessary to enforce) the following mandatory rules that CBOE was required to follow under the Commodity Exchange Act:

- a. 7 U.S.C. §7(d)(2)(A): “The board of trade shall establish, monitor, and enforce compliance with the rules of the contract market, including . . . (iii) rules prohibiting abusive trade practices on the contract market.”
- b. 7 U.S.C. §7(d)(2)(B): “ The board of trade shall have the capacity to detect, investigate, and apply appropriate sanctions to any person that violates any rule of the contract market.”
- c. 7 U.S.C. §7(d)(3): “The board of trade shall list on the contract market only contracts that are not readily susceptible to manipulation.”
- d. 7 U.S.C. §7(d)(4): “The board of trade shall have the capacity and responsibility to prevent manipulation, price distortion, and disruptions of the delivery or cash-settlement process through market surveillance, compliance, and enforcement practices and procedures, including – (A) methods for conducting real-time monitoring of trading; and (B) comprehensive and accurate trade reconstructions.”

- e. 7 U.S.C. §7(d)(5)(A): “To reduce the potential threat of market manipulation or congestion (especially during trading in the delivery month), the board of trade shall adopt for each contract of the board of trade, as is necessary and appropriate, position limitations or position accountability for speculators.”
- f. 7 U.S.C. §7(d)(9)(A): “The board of trade shall provide a competitive, open, and efficient market and mechanism for executing transactions that protects the price discovery process of trading in the centralized market of the board of trade.”
- g. 7 U.S.C. §7(d)(10): “The board of trade shall maintain rules and procedures to provide for the recording and safe storage of all identifying trade information in a manner that enables the contract market to use the information – (A) to assist in the prevention of customer and market abuses; and (B) to provide evidence of any violations of the rules of the contract market.”
- h. 7 U.S.C. §7(d)(12): “The board of trade shall establish and enforce rules – (A) to protect markets and market participants from abusive practices committed by any party, including abusive practices committed by a party acting as an agent for a participant; and (B) to promote fair and equitable trading on the contract market.”
- i. 7 U.S.C. §7(d)(19): “Unless necessary or appropriate to achieve the purposes of this chapter, the board of trade shall not – (A) adopt any rule or taking [sic] any action that results in any unreasonable restraint of trade; or

(B) impose any material anticompetitive burden on trading on the contract market.”

149. As detailed in the Complaint above, CBOE had knowledge and/or with reckless disregard of its rules/regulations avoided acquiring such knowledge that: the SOQ used for settlement of VIX Futures and VIX Options was susceptible to being manipulated and was, in fact, being manipulated; the manipulation of the SOQ was manipulating the value of VIX Futures and VIX Options that CBOE allowed to be traded; this manipulation of the SOQ and VIX Futures and VIX Options constituted abusive trade practices; and nonetheless CBOE did not stop offering those products for trading, nor did it investigate, enforce, or apply appropriate sanctions against individuals or entities engaged in this manipulation and abusive trade practices.

150. As detailed in the Complaint above, CBOE failed to enforce these rules in bad faith. Specifically, CBOE knew that suspending trading in VIX Futures and VIX Options that were susceptible to manipulation would negatively impact the transaction fees and revenues CBOE realized and enjoyed during the Class Period, and would also negatively impact the value of CBOE’s stock (including shares held by and paid to CBOE officers and directors as part of their compensation). CBOE (including its officers and directors) therefore had a financial incentive to allow the manipulation described above to continue.

151. CBOE’s conduct caused injury to Plaintiff and other members of the Class who transacted via CBOE’s markets in VIX Futures and VIX Options that CBOE knew (or was recklessly indifferent to knowing) were being traded in an artificial and manipulated market, at manipulated prices, and with artificial price trends, during the Class Period.

152. The damages to Plaintiff and other members of the Class were caused by CBOE's failure to enforce bylaws, rules, regulations, or resolutions that it was required to enforce under the Commodity Exchange Act.

153. Plaintiff and other members of the Class are each entitled to damages for the violations of the CEA alleged herein.

**PRAYER FOR RELIEF**

Plaintiff requests relief as follows:

A. That the Court determine that this action may be maintained as a class action under Rule 23(a), (b)(1), (b)(2), and (b)(3) of the Federal Rules of Civil Procedure, and direct that notice of this action, as provided by Rule 23(c)(2) of the Federal Rules of Civil Procedure, be given to Class members;

B. That the Court enter an order declaring that Defendants' actions, as set forth in this Complaint, violate the law;

C. That the Court award Plaintiff and Class members damages, treble damages, punitive damages, and/or restitution in an amount to be determined at trial;

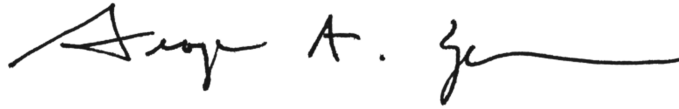
D. That the Court issue appropriate injunctive and other equitable relief against Defendants;

E. That the Court award Plaintiff pre- and post-judgment interest;

F. That the Court award Plaintiff his costs of suit, including reasonable attorneys' fees and expenses; and

G. That the Court award any and all such other relief as the Court may deem just and proper.

Dated: April 3, 2018



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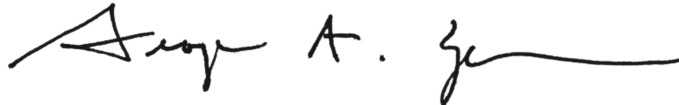
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**CERTIFICATE OF SERVICE**

I hereby certify that on April 3, 2018, I provided service of this First Amended Class Action Complaint to all counsel of record via the Court's CM/ECF system.

Dated: April 3, 2018

A handwritten signature in black ink, appearing to read "George A. Zelcs", written over a horizontal line.

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